

HP 200-1 E AI-F

Compress 3000

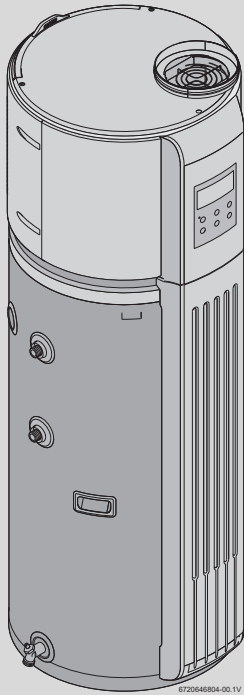
Electric Heat Pump Water Heater



<http://waterheatertimer.org/Review-GE-Heat-Pump-water-heater.html>



BOSCH



Index

1	Warnings	3	6	Troubleshooting/Problem Solving	26
2	Appliance details	5	7	Electrical diagram	33
2.1	Overview	5			
2.2	Features and safety devices	5			
2.3	Specification tables	7	8	Interior components and parts list	34
2.4	Principle of Operation (brief overview of modes)	8			
2.5	Dimensions	9	9	Protecting the environment	36
3	Installation instructions	10	10	Limited Warranty	37
3.1	Tools required	10			
3.2	Location requirements	10			
3.3	Venting (specifications and vent runs)	11			
3.4	Water piping	11			
3.5	Electric requirements	13			
3.6	Installation configurations	14			
3.7	Insulation blanket	16			
3.8	Filling the water heater	16			
3.9	Installation checklist	16			
3.10	What to expect for "normal startup"	17			
4	Operating Instructions	18			
4.1	Control Pad	18			
4.2	Safety warnings	20			
4.3	Water temperature setting	20			
4.4	Operating modes	21			
4.5	Feature buttons on the user interface	21			
4.6	Using the combination buttons	21			
4.7	Reset the temperature limiting control	22			
5	Maintenance and repair	23			
5.1	Periodic Inspection	23			
5.2	Temperature and pressure relief valve	23			
5.3	Flushing tank	23			
5.4	Draining the Water Heater	23			
5.5	Vacation and Extended Shutdown	24			
5.6	Cleaning the Filter	24			
5.7	Clearing the Condensation Drain Tubes	24			
5.8	Anode Rod servicing	25			

1 Warnings

For your safety

Do not store or use gasoline or other flammable, combustible or corrosive vapors and liquids in the vicinity of this or any other appliance.



Warning: Field wiring connections and electrical grounding must comply with local codes, or in the absence of local codes, with the latest edition of the National Electric Code, ANSI/NFPA 70, or in Canada, all electrical wiring must comply with the local codes and the Canadian Electrical Code, CSA C22.1 Part 1.



Danger: Shock hazard: line voltage is present. Before servicing the water heater, disconnect power supply. Failure to do so could result in severe personal injury or death.



Warning: The appliance should be located in an area where leakage of the heater or connections will not result in damage to the area adjacent to the appliance or to lower floors of the structure. When such locations cannot be avoided, a suitable drain pan, adequately drained, must be installed under the appliance.



Warning: If a water heater is installed in a closed water supply system, such as one having a backflow preventer in the cold water supply line, means shall be provided to control thermal expansion and to avoid the potential that the water heater may burst. Contact a plumbing professional on how to control this situation.



Warning: To avoid the potential for ignition and fire, keep appliance area clear and free from combustible materials, gasoline and other flammable vapors and liquids.



Warning: This water heater is not suitable for pool heating.



Warning: Precautions must be taken prior to manually operating the relief valve to avoid contact with hot water which may cause a scalding injury and to prevent water damage.



Caution: Label all wires prior to disconnection when servicing controls. Improper wiring may lead to shock hazards and fires, which may cause serious injury or death. Verify proper operation after servicing.

FCC:

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

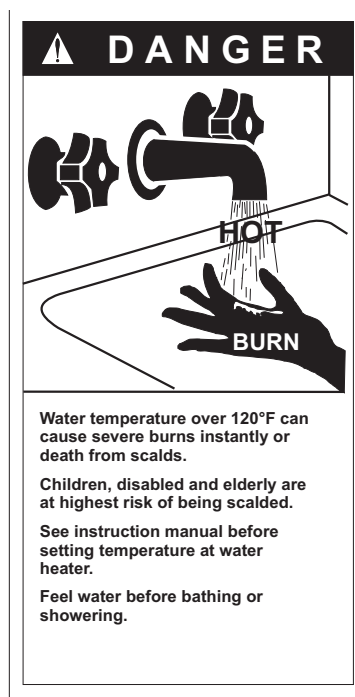


Fig. 1

To prevent serious injury, unit damage or damage to other property, please use the electric heat pump properly, please read this manual carefully and understand the following information correctly.



Warning: Improper or incorrect operation of the water heater can create a hazardous condition that may lead to serious injury or death. Read this manual before installing or operating the water heater.

For installation in the state of California

California Law requires that residential water heaters must be braced, anchored or strapped to resist falling or horizontal displacement due to earthquake motions. For residential water heaters up to 52 gallon capacity, a brochure with generic earthquake bracing instructions can be obtained from:

Office of the State Architect, 400 P Street,
Sacramento, CA 95814

or you may call 916.324.5315 or ask a water heater dealer.

However, applicable local codes shall govern installation. For residential water heaters of a capacity greater than 52 gallons, consult the local building jurisdiction for acceptable bracing procedures.

The California Safe Drinking Water and Toxic Enforcement Act requires the Governor of California to publish a list of substances known to the State of California to cause cancer, birth defects, or other reproductive harm, and requires businesses to warn of potential exposure to such substances.



Proposition 65 Warning: this product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. This appliance can cause low-level exposure to some of the substances included in the Act.

2 Appliance details

2.1 Overview

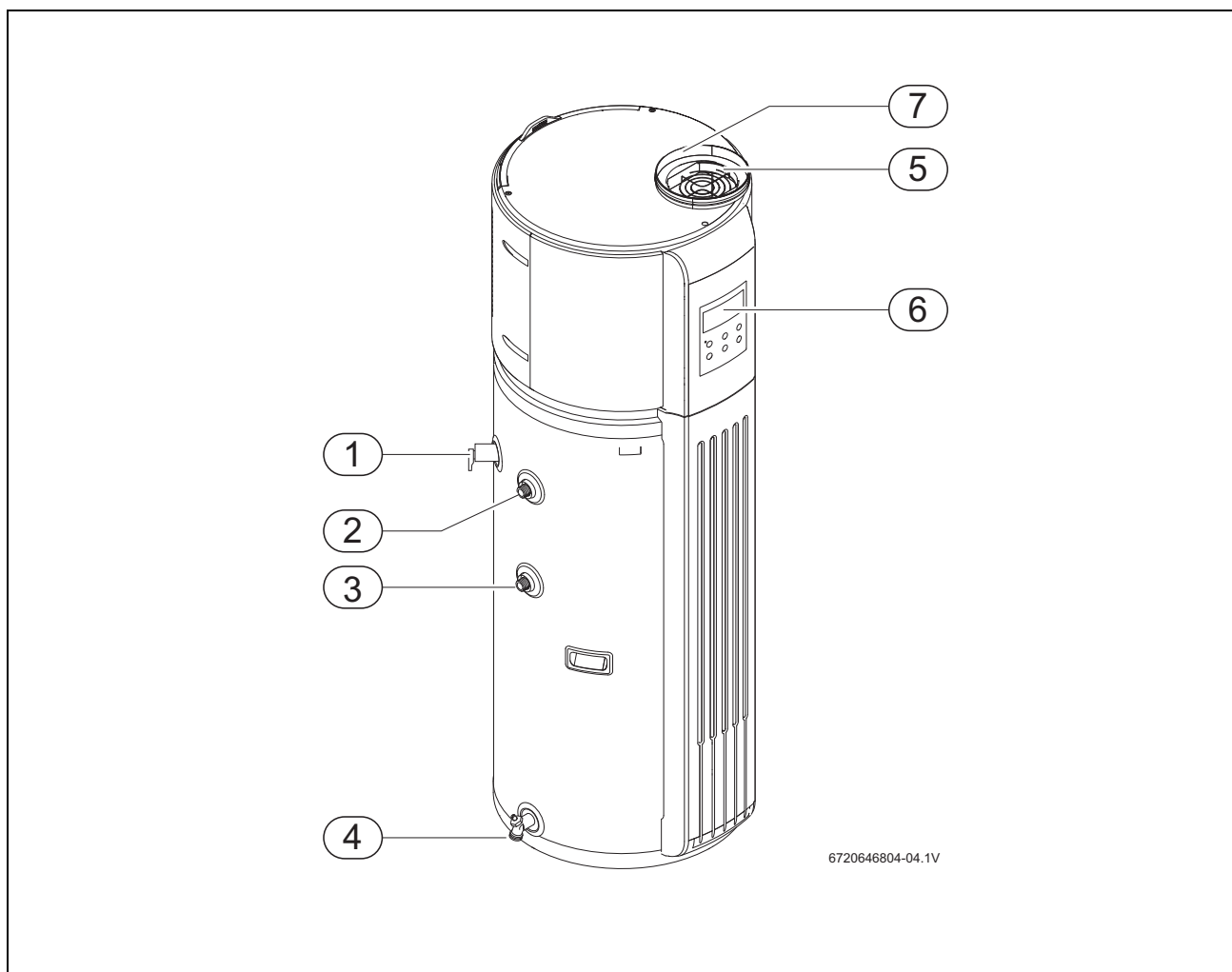


Fig. 2 Appliance overview

- 1 Temperature & pressure relief valve
- 2 Hot outlet
- 3 Cold inlet
- 4 Drain
- 5 Vent opening
- 6 Display
- 7 8" vent collar



Vent collar does not come installed on the water heater.

air exchanger, heat may be taken from a mechanical room or a sun porch or attic space, or from hot areas in any other domestic environments.

Heating capacity

The unit absorbs ambient energy and releases the heat into the water stored in the tank. If the ambient temperature is low, the heating capacity of the heat pump will be reduced, but you can still rely on the electrical elements for backup.

2.2 Features and safety devices

Environmentally friendly and safe

Produces no harmful gas locally from the combustion of oil, coal, or gas and is free of potential hazards from carbon monoxide.

Easy to operate and multiple heat sources

Easy to use adjustment keys for easy setting of the water temperature. Depending upon the location of the

Temperature limiting controls (TCOs)

The water heater is equipped with two temperature-limiting controls (TCOs) that are located above the upper heating element in contact with the tank surface. If for any reason the water temperature becomes excessively high, the temperature-limiting control (TCO) breaks the power circuit to the heating element. Once the control opens, it must be reset manually. Resetting of the temperature limiting controls should be done by a qualified service technician.



Caution: The cause of high temperature conditions must be investigated by a qualified service technician and corrective action must be taken before placing the water heater in service again.

Defrosting

Under the heating mode, the unit will shut down the heat pump automatically if an unusually low temperature is detected at the evaporator. This cycle can last between 2 and 10 minutes and ensures maximum heating efficiency.

The fan motor will stop running when the unit is defrosting.

Working conditions

In order to use the unit correctly, please run the unit at ambient temperature 45°F - 115°F.

The unit includes sophisticated electronic devices, care should be taken to feed the unit only with potable water. Do not use untreated water from lakes, rivers or untreated groundwater!

Overheating protection

When the water temperature reaches 165°F power to the unit will be cut off (see section 4.7 for instructions on resetting the temperature limiter).

Water temperature or pressure protection

The unit is equipped with a T&P valve for your safety. If the tank pressure reaches 150PSI or the temperature reaches 210°F, the T&P valve will open automatically to relieve the pressure and or reduce the temperature to safe limits.

2.3 Specification tables

Model			HP200-1E...		
Running models			Economy	Auto	E-heater
Running ambient temp.		°F	45 - 115	45 - 115	-5 - 130
Outwater Temp.		°F	Default 120°, 100°F - 140°F		
Power supply		Ph/V/Hz	1-240-60		
Storage size		US Gal	50		
Water heating	Capacity	kW / BTU/h	1.50 / 5123	1.50 / 5123	4.00 / 13661
	Max. input	kW / BTU/h	0.80 / 2732	4.50 / 15368	4.00 / 13661
	First Hour Rating	US Gal	-	56.00	52.00
	Max. current	A	6.5	21.6	18.7
Ambient temp.		°F	- 5 - 130		
Unit	Dimension (D×H)	inch	Ø22.4 × 64.5		
	Packing (W×H×D)	inch	25 × 68.5 × 27		
	Weight	lbs	209.4 / 242.5		
Noise level		dB(A)	48		
Refrigerant type/quantity		lbs	R134a/1.7		
Refrigerant design pressure		PSIA	331/86 at ambient 70°F		
Tank design pressure		PSI	150		
Throttling type			Thermal expansion valve		
System protection			TCO, TDO, P&T valve, over-load protector temp. ground fault protector etc.		
Air flow		Ft ³ /h	13066 / 9888 / 7063		
Compressor	Model		FFC110HBX		
	Type		Piston		
	Brand		Embraco		
	Input	kW	0.7		
Fan motor	Model		YDK12-6B		
	Brand		welling		
	Input	W	40		
	Speed	RPM	970/750/550		
Water pipeline	Water inlet pipe		Male NPT ¾		
	Water outlet pipe		Male NPT ¾		
	Drainage pipe		Hose fitting NPT ¾		
	PT valve joint		Female NPT ¾		
	Max. pressure	psi	145		
	Heat exchanger		Dividing wall type heat exchanger		
E-heater		kW	4.0 × 2		

Table 1

2.4 Principle of Operation (brief overview of modes)

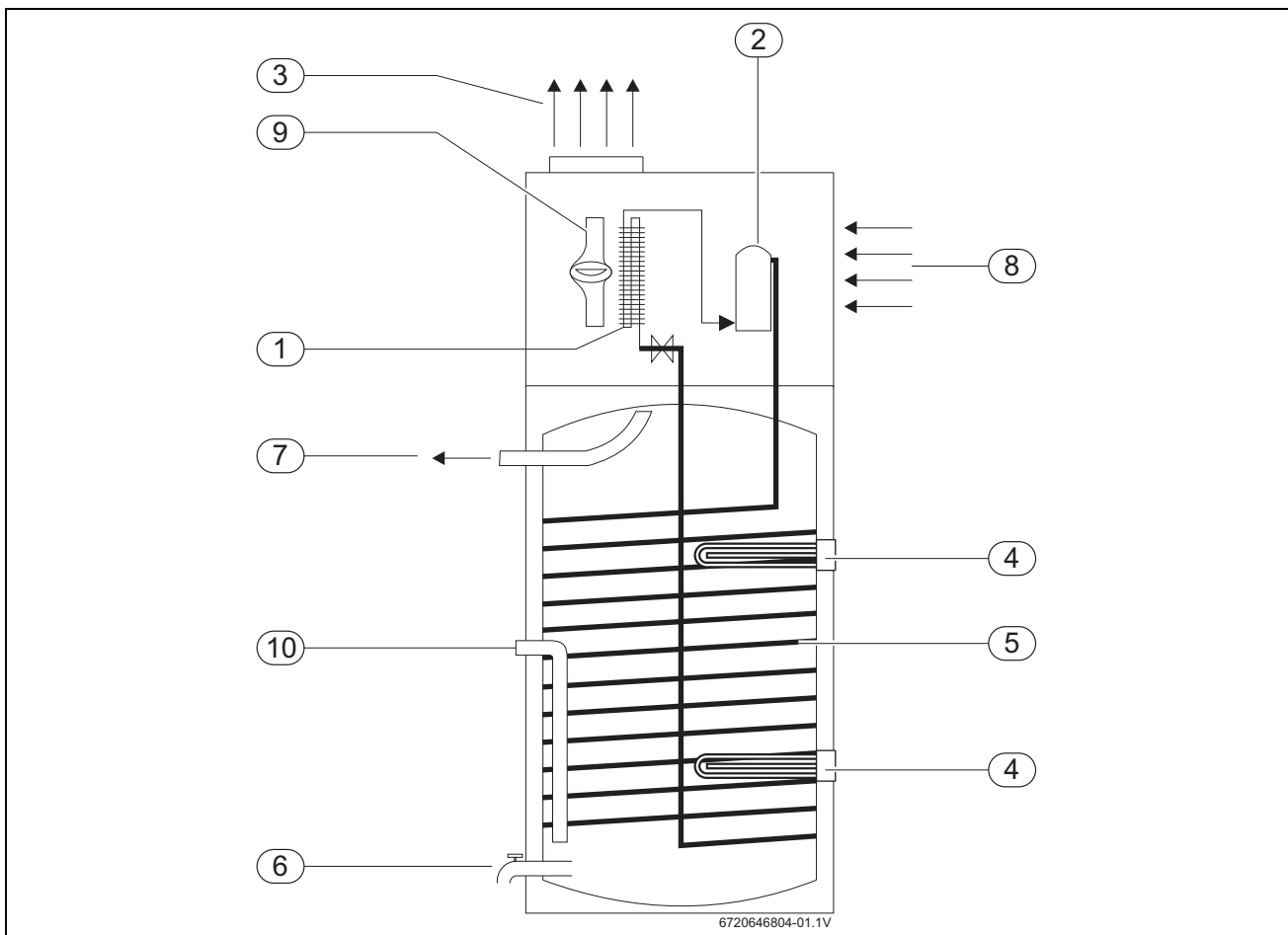


Fig. 3

- | | |
|----|---------------------------------|
| 1 | Air Heat Exchanger |
| 2 | Compressor |
| 3 | Cooled / Dehumidified Air |
| 4 | Upper/Lower Electric element |
| 5 | Condensor Coil (heat exchanger) |
| 6 | Drain valve |
| 7 | Domestic Hot Water outlet |
| 8 | Ambient Room Air |
| 9 | Fan |
| 10 | Cold water supply |

System theory

An Electric Heat Pump Water Heater draws heat from the ambient air and transfers that heat to the water in the tank. Ambient air inside the room where the water heater is installed is blown across an evaporator by a fan. Cold refrigerant inside an expansion valve is heated from this ambient air. This warmed refrigerant is then sent through a compressor where it becomes extremely hot. The hot refrigerant then passes through a condenser coil that is wrapped around the outside of the tank. The heat from the hot refrigerant is transferred to the stored water inside the tank. After transferring its heat, the now warm refrigerant is pushed through an expansion valve where it is cooled and depressurized so the process can begin again. In addition, the ambient air is cooled and dehumidified as it passes through the evaporator and can be used to adjust the climate of the room.

Built in controls offer a variety of operational modes to suit every user's needs. When operating with the heat pump only (Economic Mode), the water is heated using only the ambient air. Economic mode does not activate the electric element inside. This mode may take longer to heat the water to set temperature but uses less than 1/2 the electricity of a similar size electric tank.

The Auto mode use the electric element to supplement the heat pump in the event that the water is not reaching set temperature.

Electric mode allows for the water heater to function as a standard electric tank without the use of the heat pump.

Brief overview of modes

- **Economic Mode;**
- **Electric Mode;**
- **Auto Mode (default mode);**
- **Vacation Mode.**

2.5 Dimensions

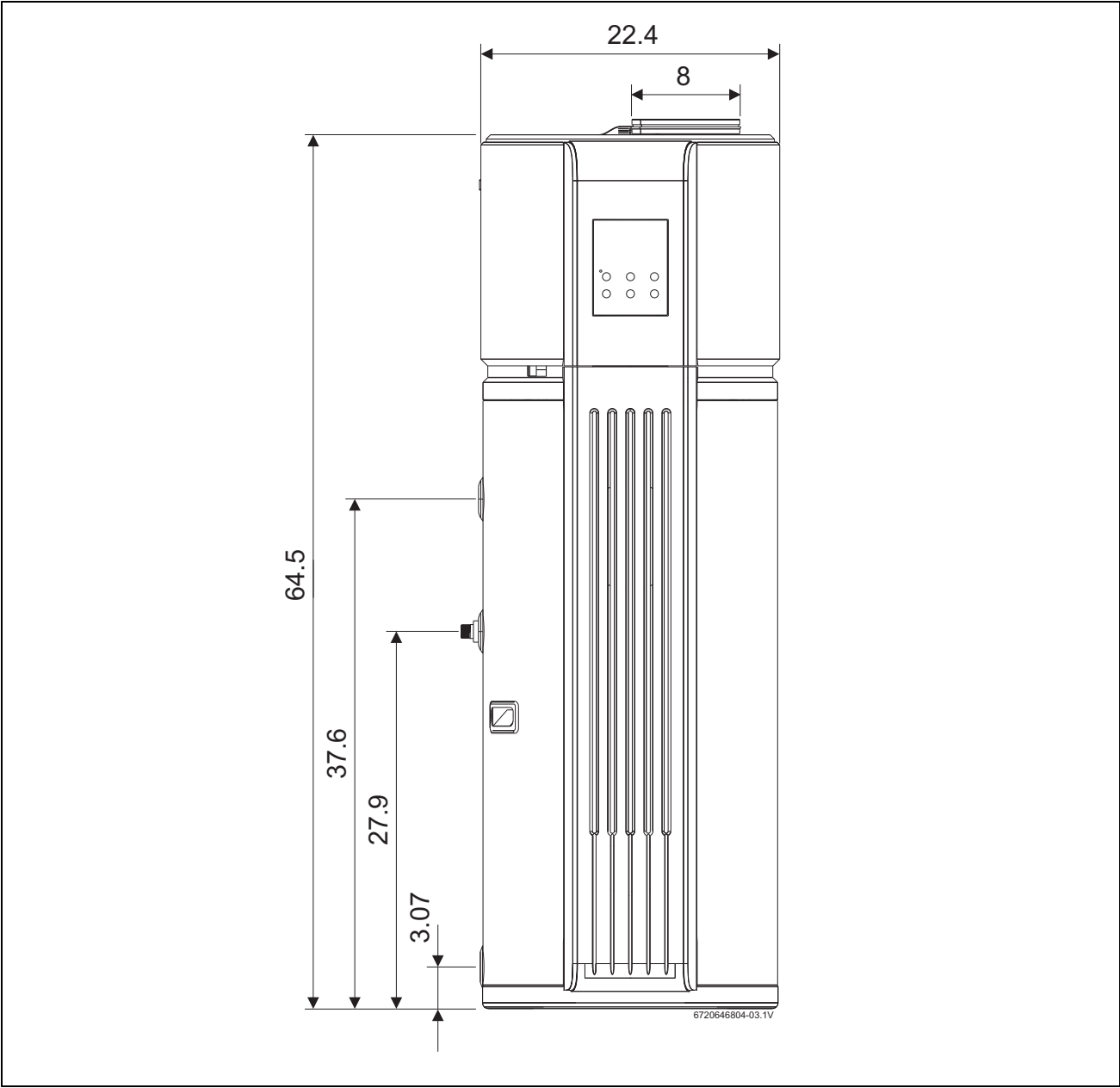


Fig. 4 Dimensions (inches)

3 Installation instructions

The manufacturer's warranty does not cover any damage or defect caused by improper installation, attachment or use of any type of energy-saving or other unapproved devices (other than those authorized by the manufacturer) into, onto or in conjunction with the water heater.

The manufacturer disclaims any responsibility for such loss or injury resulting from the use of such unauthorized devices.

3.1 Tools required

- Wrench $\frac{3}{4}$ "
- Phillips screwdriver
- Flat screwdriver
- Wire strippers
- Level
- Measuring tape
- Standard plumbing tools.

3.2 Location requirements



Warning: To avoid the potential for ignition and fire, the water heater should not be installed in a space where liquids which give off flammable vapors are to be used or stored.

Locate the water heater in a clean, dry area as near as practical to the area of greatest hot water demand. Long uninsulated hot water lines can waste energy and water.

Note: Because this unit draws in air from the room to heat the water, the room must be at least 10' x 10' x 7' (700 cubic feet) or larger. If the room is smaller, there must be louvers installed to allow for adequate airflow. Place the water heater in such a manner that the air filter, cover and front panels can be removed to permit inspection and servicing, such as removal of elements, draining the tank, or cleaning of the filter.

The water heater and water lines should be protected from freezing temperatures and highly corrosive atmospheres. Do not install the water heater in outdoor or unheated, unprotected areas.



Caution: The water heater should not be located in an area where leakage of the tank or connection will result in damage. In installations where risk of water damage cannot be avoided, a suitable catch pan, adequately drained, must be installed under the water heater.



Warning: This water heater **SHOULD NOT** be installed in a space where liquids which give off flammable vapors are to be used or stored. Such liquids include gasoline, LP gas (butane and propane), paint or adhesives and their thinners, solvents or removers. Because of natural air movement in a room or other enclosed space, flammable vapors can be carried from where their liquids are being used or stored. Any arc within the water heater's electronic controls can ignite these vapors causing an explosion or fire which may result in severe burns or death to those in range, as well as property damage.

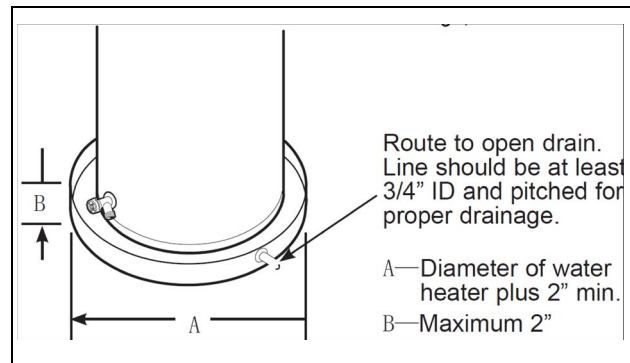


Fig. 5

NOTE: Auxiliary catch pan **MUST** conform to local codes. Catch Pan Kits are available from the store where the water heater was purchased, a building supply store or any water heater distributor.

Local installation regulations

This water heater must be installed in accordance with these instructions, local codes, plumbing codes (UPC or IPC), utility codes, utility company requirements or, in the absence of local codes, the latest edition of the National Electrical Code. It is available from some local libraries or can be purchased from the National Fire Prevention Association, Batterymarch park, Quincy, MA 02169 as booklet ANSI/NFPA 70.

Required clearances

It is recommended that there is 5- $\frac{1}{2}$ " of clearance (air space) between any object and the front and rear shrouds.

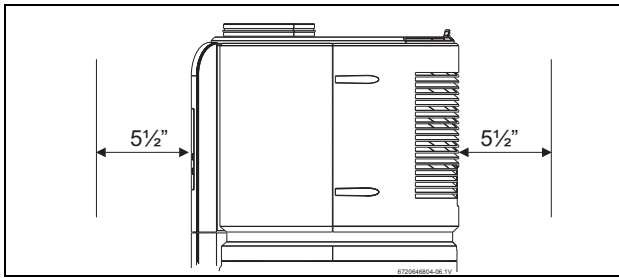


Fig. 6

A 27" minimum vertical clearance is required to remove the filter for cleaning and to replace the anode rod. The hot and cold water plumbing and electrical connections must not interfere with the removal of the filter.

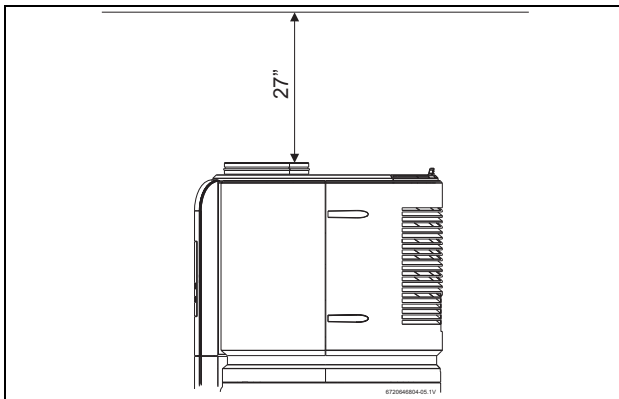


Fig. 7

Condensation drain

The unit has a condensate drain, therefore a drain must be available in close proximity to the unit. The drain must be no higher than 36" above the floor (laundry drain is acceptable).

If no drain is available, then a common condensate pump with a capacity no less than 1 gallon/day must be purchased from a local builder and supply store and installed.

3.3 Venting (specifications and vent runs)

Venting the outlet air of the water heater to another room may be an option for specific applications. See Section 3.6.

- Duct diameter: 8"
- Maximum outlet duct length: 16.5 feet
- Maximum Air flow: 219 CFM
- Maximum no. of elbows: 1.

The vent collar accessory (see Fig. 2) must be installed in order to accommodate the required 8" diameter vent pipe. Line up tabs on vent collar with slots in vent opening. Rotate to lock into place.

If terminating venting to the outdoors, pitch horizontal pipe downward towards termination 1/4" per foot to avoid damage from rain.

3.4 Water piping

3.4.1 Inlet - Outlet connections

Refer to the illustration below for suggested typical installation. The installation of unions or flexible copper connectors is recommended on the hot and cold water connections so that the water heater may be easily disconnected for servicing if necessary. The HOT and COLD water connections are clearly marked and are 3/4"NPT on all models.



Install a shut-off valve in the cold water line near the water heater. This will enable easier service or maintenance of the unit later.

IMPORTANT: Do not apply heat to the HOT or COLD water connections. If sweat connections are used, sweat tubing to adapter before fitting the adapter to the water connections on heater. Any heat applied to the hot or cold water connection will permanently damage the dip tube.

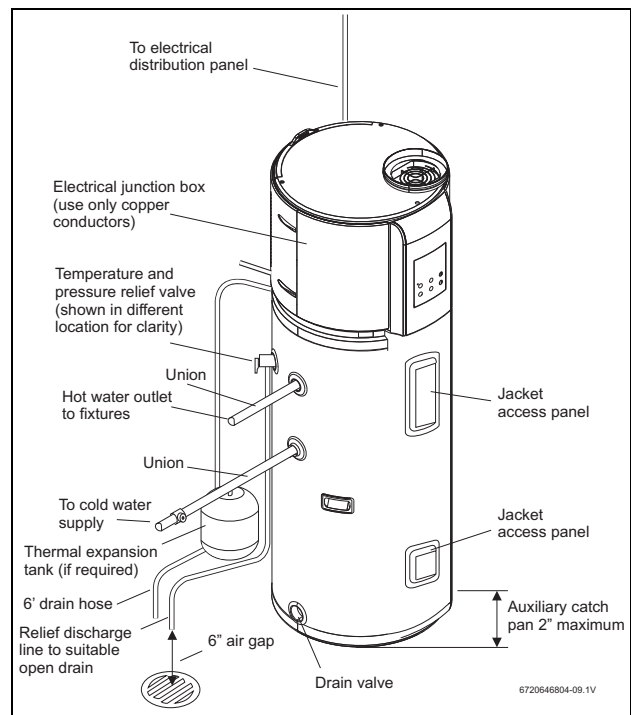


Fig. 8 Typical installation

3.4.2 Dielectric union (recommended accessory)

Different metals between plumbing and tank materials and additionally the effect of hot water can cause corrosion of one of the metals (generally the one in the tank is the metal attacked)

The Dielectric union will avoid any physical contact between the two metals, acting as an effective insulator and preventing this attack. How quick this corrosion progresses, if at all, depends on the content of your water, its pH, the dissolved minerals and the metals involved.

Failing to install this accessory will void the tank warranty.

3.4.3 Condensate Drain Tubes

This unit has a condensation tray. The water collected in the tray drains out of the drain ports coming off the back of the unit. Two flexible hoses are included with this unit. It is important that both of these hoses are attached to the two drain ports coming off the back of the unit. The upper drain serves as an overflow drain that will operate only if the bottom drain is blocked. Water leaking from the upper drain is an indicator that the lower drain, and possibly the condensate pan itself, require cleaning.

- ▶ Attach one end of the longer 6' hose to the lower drain port on the back of the unit, underneath the rear cover.
- ▶ Direct the other end to a drain in the floor or no higher than 3' above the floor.
If such drain is unavailable, a condensate drain pump (not provided) must be purchased and installed.
- ▶ Attach the shorter 3" hose to the top drain port.

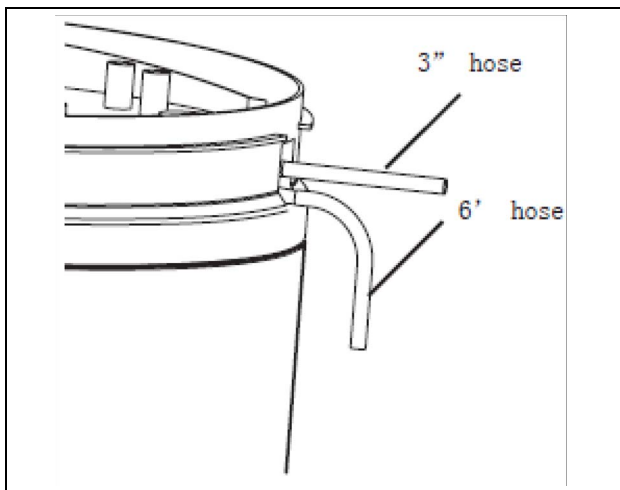


Fig. 9

3.4.4 T&P Valve

A combination temperature and pressure-relief valve, complying with the Standard for Relief Valves for Hot Water Supply Systems, ANSI Z21.22, is supplied and must remain installed in the opening provided and marked for the purpose on the water heater. No valve of any type should be installed between the relief valve and the tank. Local codes shall govern the installation of relief valves.

Connect the outlet of the relief valve to a suitable open drain so that the discharge water cannot contact live electrical parts or persons and to eliminate potential water damage. Under no circumstances should the relief valve vent be connected to the condensate drain line.

Piping used should be of a type approved for hot water distribution. The discharge line must be no smaller than

the outlet of the valve and must pitch downward from the valve to allow complete drainage (by gravity) of the relief valve and discharge line. The end of the discharge line should not be threaded or concealed and should be protected from freezing. No valve of any type, restriction, reducing coupling or tee should be installed in the discharge line.



Warning: To reduce the risk of excessive pressures and temperatures in this water heater, install temperature and pressure protective equipment required by local codes and no less than a combination temperature and pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials, as meeting the requirements for Relief Valves for Hot Water Supply Systems, ANSI Z21.22.

This valve must be marked with a maximum set pressure not to exceed the marked maximum working pressure of the water heater. It should be installed into an opening provided and marked for this purpose in the water heater, and vented so that any discharge from the valve exits only within 6 inches above, or at any distance below, the structural floor, and does not contact any live electrical part. The discharge opening must not be blocked or reduced in size under any circumstances.

3.4.5 Thermal expansion tank

Determine if a check valve exists in the inlet water supply line. It may have been installed in the cold water line as a separate backflow preventer, or it may be part of a pressure-reducing valve, water meter or water softener. A check valve located in the cold water inlet line can cause what is referred to as a "closed water system". A cold water inlet line with no check valve or backflow prevention device is referred to as an "open" water system.

As water is heated, it expands in volume and creates an increase in the pressure within the water system. This action is referred to as "thermal expansion". In an "open" water system, expanding water which exceeds the capacity of the water heater flows back into the city main where the pressure is easily dissipated.

A "closed water system", however, prevents the expanding water from flowing back into the main supply line, and the result of "thermal expansion" can create a rapid and dangerous pressure increase in the water heater and system piping. This rapid pressure increase can quickly reach the safety setting of the relief valve, causing it to operate during each heating cycle. Thermal expansion, and the resulting rapid and repeated expansion and contraction of components in the water heater and piping system, can cause premature failure

of the relief valve, and possibly the heater itself. Replacing the relief valve will not correct the problem! The suggested method of controlling thermal expansion is to install an expansion tank in the cold water line between the water heater and the check valve. The expansion tank is designed with an air cushion built in that compresses as the system pressure increases, thereby relieving the over-pressure condition and eliminating the repeated operation of the relief valve. Other methods of controlling thermal expansion are also available. Contact your installing contractor, water supplier or plumbing inspector for additional information regarding this subject.

3.5 Electric requirements



Caution: Do not mis-wire electrical connections. 240V AC must be applied to L1 and L2 wires as shown in Fig. 10. Failure to do so will VOID the warranty. Connecting the water heater to 120V AC may damage the compressor or other electrical components.

Power requirements

Check the markings on the rating plate of the water heater to be certain the power supply corresponds to the water heater requirements.

Electrical connections

A separate branch circuit with copper conductors, over-current protective device and suitable disconnecting means must be provided by a qualified electrician.

All wiring must conform to local codes or latest edition of National Electrical Code ANSI/NFPA 70.

The water heater is completely wired to the junction box at the top of the water heater. An opening for 1/2" or 3/4" electrical fitting is provided for field wiring connections.

The voltage requirements and wattage load for the water heater are specified on the rating label on the front of the water heater.

The branch circuit wiring should include either:

- Metallic conduit or metallic sheathed cable approved for use as a grounding conductor and installed with fittings approved for the purpose.
- Non metallic sheathed cable, metallic conduit or metallic sheathed cable not approved for use as a ground conductor shall include a separate conductor for grounding. It should be attached to the ground terminals of the water heater and the electrical distribution box.

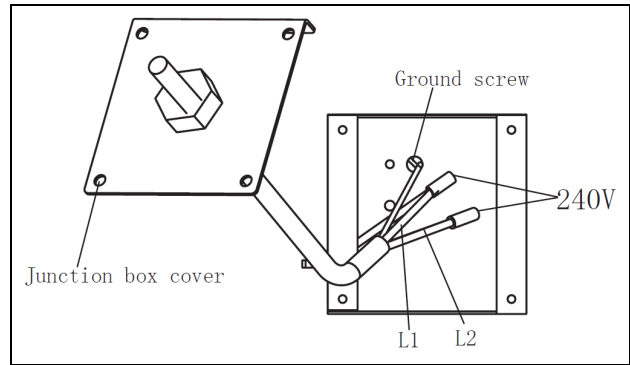


Fig. 10 Water heater junction box



Warning: Proper ground connection is essential. The presence of water in the piping and water heater does not provide sufficient conduction for a ground. Use of non-metallic piping, dielectric unions, flexible connectors, etc., can cause the water heater to be electrically isolated, which may cause fire or shock.

This water heater must be connected to the building electrical system on a dedicated branch circuit. A 25amp circuit breaker must be installed for overcurrent protection.

This water heater must be connected to the building's electrical supply with 10AWG copper wire or larger. If higher wattage elements are installed, consult the National Electrical Code (NFPA 70) to determine the proper circuit breaker and minimum wire size.

3.6 Installation configurations

3.6.1 Using heat from existing space (Fig. 11)

The water heater can remove heat from an area such as a garage or boiler room making the temperature in the space more tolerable in the summer months.

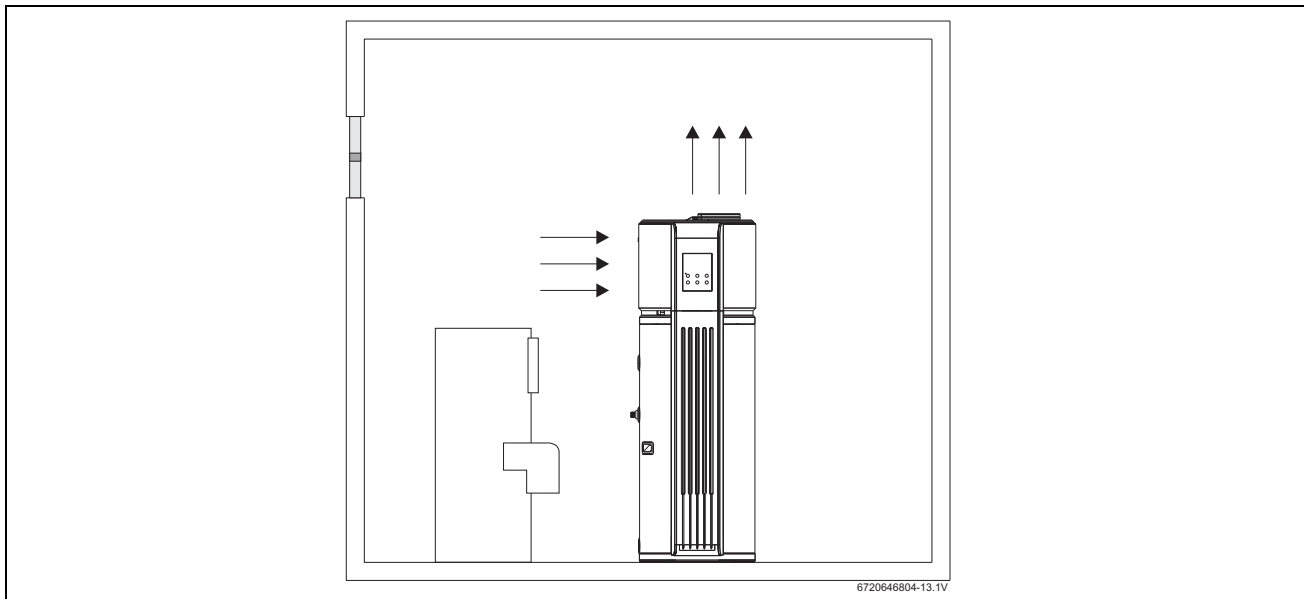


Fig. 11

3.6.2 Cooling in the recirculating air mode (Fig. 12)

The room air is extracted from the storage room and is subsequently cooled and dehumidified in the electric heat pump. The air is then piped to a wine cellar where the cool, dehumidified air can be utilized. Recreation rooms, boiler rooms or utility rooms are ideal installation sites. The air duct leading through warm areas must be insulated to prevent the formation of condensation.

Alternatively, the cool air can be diverted outdoors if the cooling effect is not needed (Fig. 13).

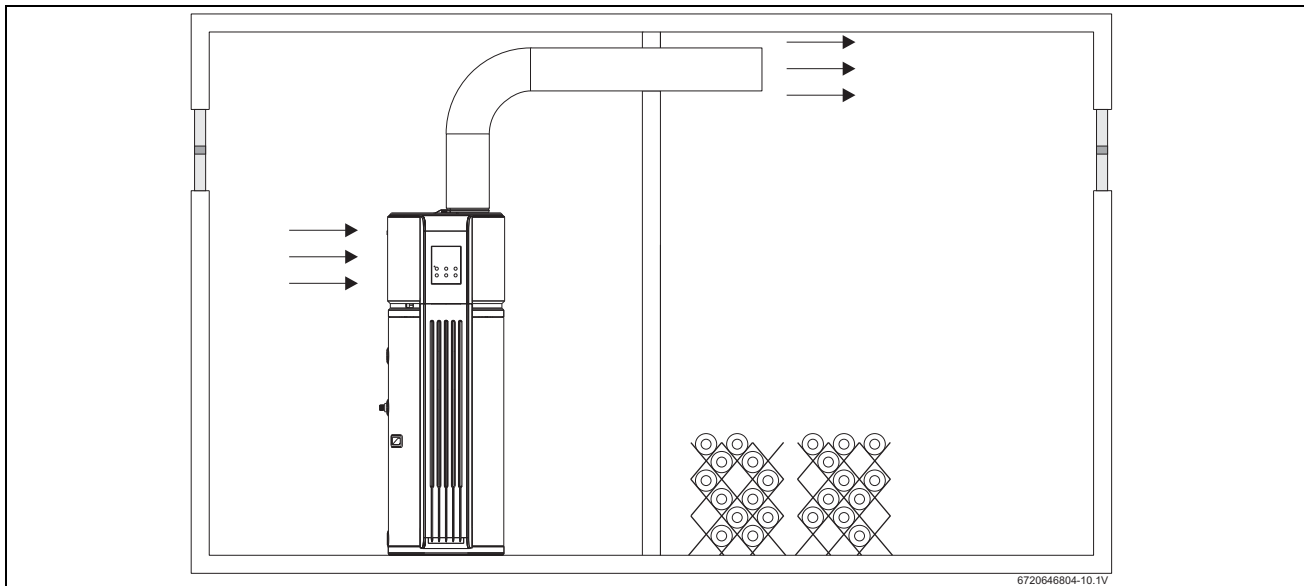


Fig. 12

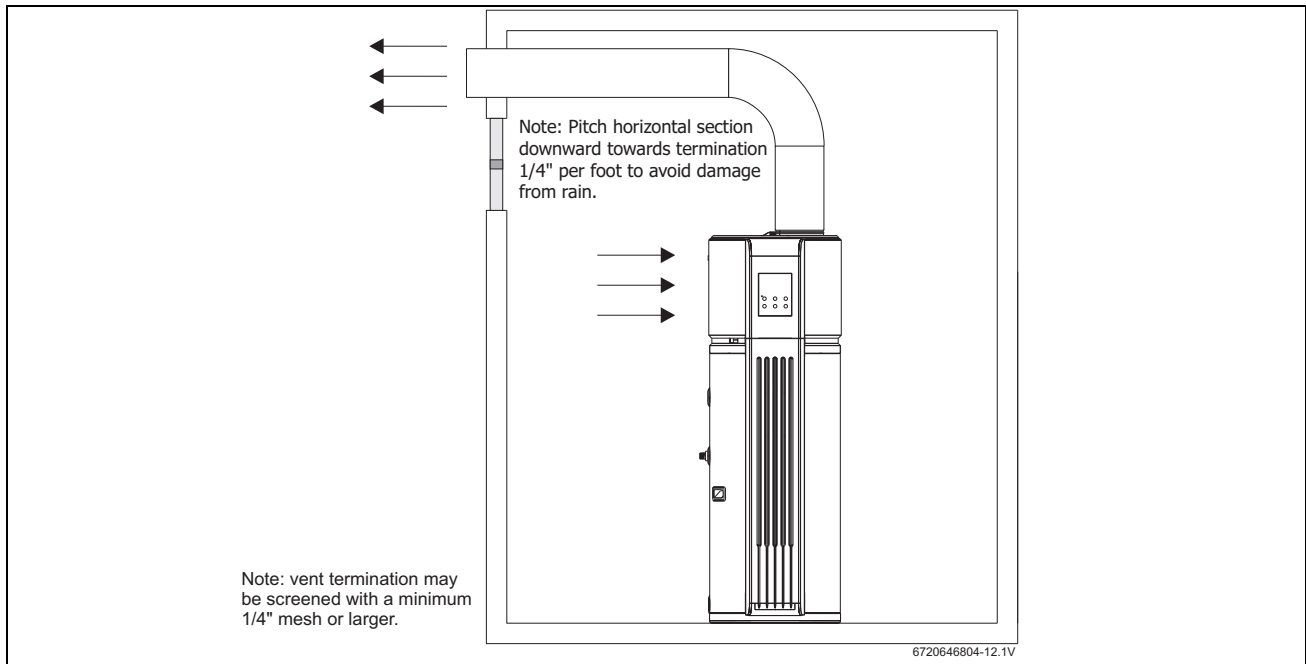


Fig. 13

3.7 Insulation blanket

If an insulation blanket is installed, the manufacturer's instructions included with the kit must be carefully followed.

Application of any external insulation, blankets or water pipe insulation to this water heater will require careful attention to the following:

- Do not cover the temperature and pressure-relief valve.
- Do not cover access panels to the heating elements.
- Do not cover the electrical junction box of the water heater.
- Do not cover the operating or warning labels attached to the water heater or attempt to relocate them on the exterior of the insulation blanket.
- Do not block the air inlet grill or the exhaust vent opening.

3.8 Filling the water heater



Warning: The tank must be full of water before heater is turned on. The water heater warranty does not cover damage or failure resulting from operation with an empty or partially empty tank.

- ▶ Turn off power supply.
- ▶ Make certain the drain valve is completely closed.
- ▶ Open the shut-off valve in the cold water supply line.
- ▶ Open a hot water faucet to purge air from the water heater and piping.
- ▶ A steady flow of water from the hot water faucet(s) indicates a full water heater.
- ▶ Turn on power supply.

3.8.1 Water quality

If your water quality exceeds the levels in the table below, you should consider treating or conditioning the water entering the water heater. Bosch's warranty does not cover product failures resulting from water quality related issues.

Contaminant	Recommended Level
Total Hardness ¹⁾	More than 2 gpg
Aluminum	Up to 0.2 mg/L
Chlorides	Up to 250 mg/L
Copper	Up to 1.0 mg/L
Fluoride	Up to 2.0 mg/L

Table 2 Source: Part 143 National Secondary Drinking Water Regulations

Contaminant	Recommended Level
Iron	Up to 0.3 mg/L
Manganese	Up to 0.05 mg/L
pH	6.5 to 8.5
Silver	Up to 0.10 mg/L
Sulfate	Up to 250 mg/L
TDS (Total Dissolved Solids)	Up to 250 mg/L
Zinc	Up to 250 mg/L

Table 2 Source: Part 143 National Secondary Drinking Water Regulations

- 1) Hardness is not regulated by the National Secondary Drinking Water Regulations

3.9 Installation checklist

1. Tank location

- Is room size less than 10' x 10' x 7' (700 cu. ft.)? If yes, louvered door or similar ventilation is needed.
- Is there 5-1/2" of clearance (air space) between any object and the front and rear shrouds?
- Is front of unit free and clear?
- Use level to confirm water heater is exactly vertical. If not condensate will not drain properly. Add shims as needed under the base of the unit.
- Are bracing straps (if required) in place?

2. Plumbing connections

- Plumbing line must not block air filter removal on top of the unit.
- Check for leaks on plumbing lines and water heater connections.

3. Condensate lines are in place

- Connect both drain lines. Connect longer condensate tube to lower drain and run to an appropriate drain or condensate pump.

4. Ensure that the Temperature and Pressure-Relief Valve is operational and the drain line is installed per local code.

5. Electrical connections

- Electrical connections do not prevent air filter removal.
- Confirm that water heater electrical circuit is properly isolated.

6. Verify control panel displays 120°F Auto mode.

7. Front cover is in place.

3.10 What to expect for “normal startup”

After the unit has been installed, with all electrical and water connections secure and checked, the unit should be filled with water (vent tank by opening a hot water faucet somewhere in home to allow tank to fully fill with water). Once tank is full and power is ON, the user must press the POWER button on the user interface. When the red light on the upper left portion of the power button comes on, the heater is on and is ready to begin heating.

Approx. elapsed time	HPWH actions	Comments
0 to 1.5 minutes	Unit is silent	This 3 minute off-time prevents compressor damage
1.5 to 3 minutes	Fans turn on	
3 to 8 minutes	Compressor turns on and runs for 5 minutes	This 5-minute period is used to ensure the tank is full of water (Dry-fire prevention algorithm)
8 to 30 minutes	Compressor turns off, and Upper Element turns on for about 20 minutes	To quickly provide initial amount of hot water for user (about 25 gallons)
30 minutes and beyond	Upper element turns off and compressor turns back on	Uses efficient heat pump for majority of heating

Table 3



Note: The heat pump operating range is 45°F to 115°F. If the ambient temperature is outside of this range, the compressor will not be able to run and the backup electric elements will be used until the ambient temperature returns to the operating range.



Note: Unit automatically defaults to Auto Mode.

4 Operating Instructions

4.1 Control Pad

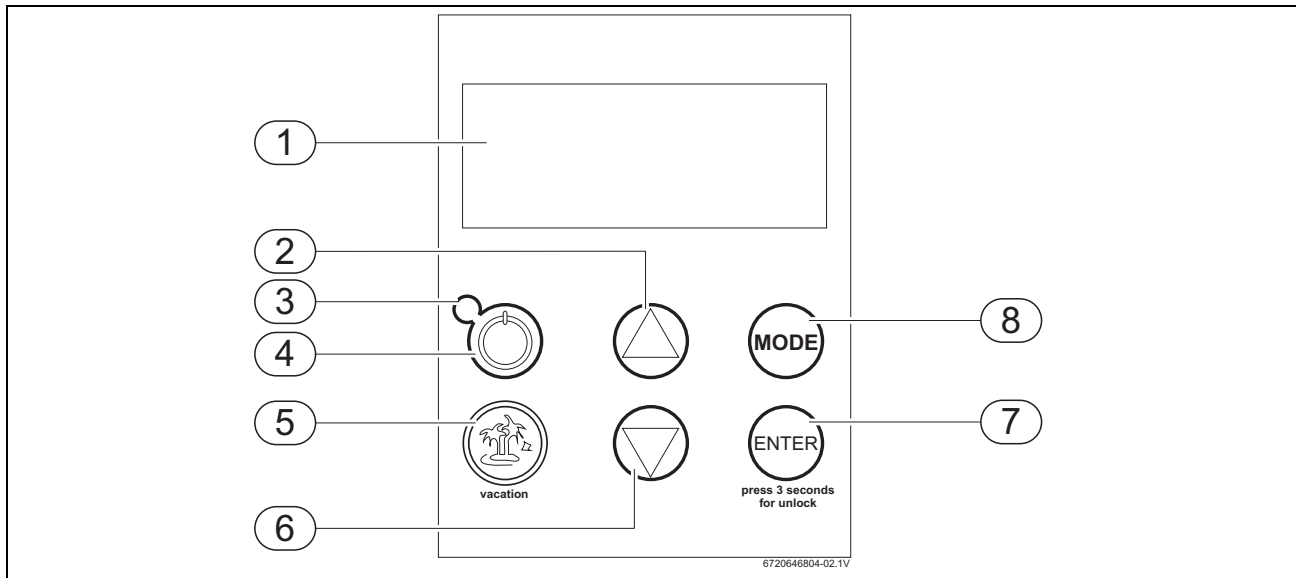


Fig. 14

1 Display

2 Up

Use up arrow to increase value or turn page up.

3 Running light

An illuminated light means the unit is running. When the light is off the unit is not running. When the light is flashing the unit is in error or under protection.

4 Power

For starting or shutting down the unit, note: when the unit is in stand-by, the function still can be used.

5 Vacation

Use this button during times when no hot water will be used, such as vacation for an extended period of time.

6 Down

For decreasing the value or turn page down.

7 Enter

For locking or unlocking the control pad. Press the button and the control pad will be locked.

When the panel is locked, press this key for 3 seconds to deactivate the lock.

After changing the setpoint temperature through UP/DOWN keys, press this key to confirm.

8 MODE

Users may choose between the following operating modes: auto mode, economic mode and electric mode.

4.1.1 Detailed description on the control function

Auto lock function

If no buttons are pressed 1 minute, the control pad will be locked. To deactivate the lock, press and hold the lock pad for three seconds.

Diagnostic function

This is a service function for troubleshooting problems and repair. See section 6.

Screen saver

To extend the life of the screen, the screen will be dimmed when there is no operation for one minute. Press any key to activate the screen.

4.1.2 Description of LCD display

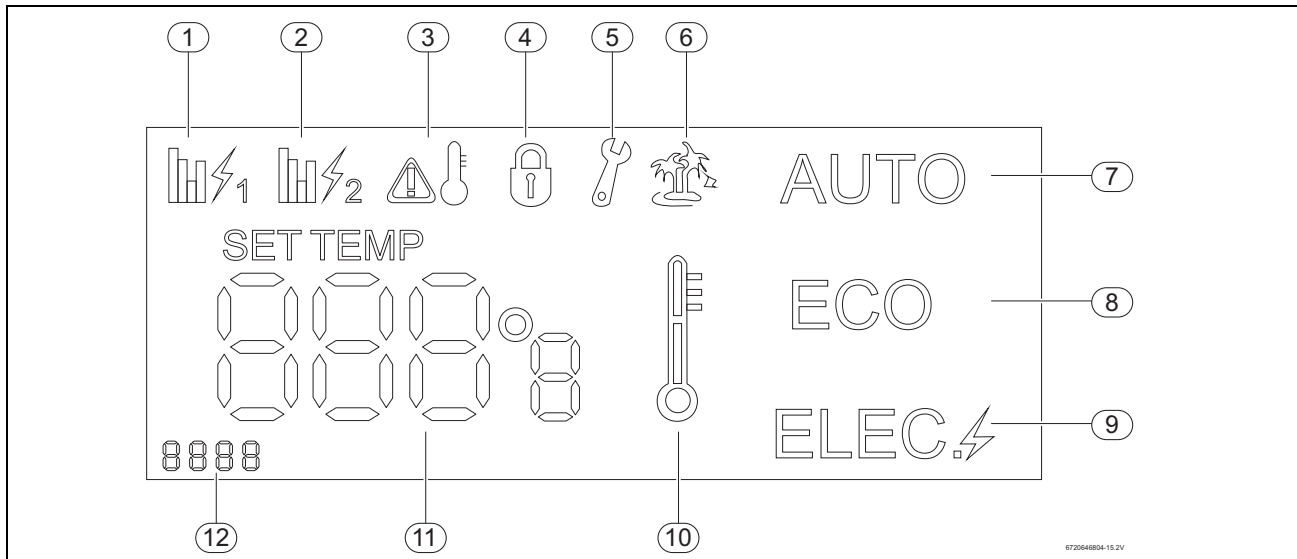


Fig. 15

1 Peak load shifting mode 1

Under this mode  will be illuminated. Heat pump mode will run and users can set water temperature. This mode will only appear when used in conjunction with a Demand Response module (not available on this model).

2 Peak load shifting mode

Under this mode  will be illuminated. Heat pump mode will run and users cannot set water temperature. The water temperature is set to be 110°F. This mode will only appear when used in conjunction with a Demand Response module (not available on this model).

3 High temperature setting

If the temperature set by user or actual temperature is above 120°F, this icon will be illuminated. It will not illuminate when the temp is ≤120°F or the unit is closed or under screen saver mode.

4 Lock icon

It will be illuminated when the control pad is locked, and will be out when the pad is unlocked.

5 Alarm icon

It will flash when there is an error status or the unit is under protection mode. In addition an alarm indicator will buzz, and it will cease when the error or protection is stopped.

6 Vacation mode icon

Reduces the required electrical energy during the absence period.

Green light is illuminated when feature is on.

7 Auto mode icon

Illuminates when the unit is on auto mode and extinguishes when the unit is not under auto mode.

Note: when the unit is on auto mode this icon will flash slowly.

8 Economic mode icon

Illuminates only when the unit is on Economic mode.

Note: when the unit is on Economic mode this icon will flash slowly.

9 Electric mode icon

Illuminates only when the unit is on electric heat mode and will be emitted when the unit is not on electric heat mode.

Note: when the unit is on electric heat mode this icon will flash slowly.

10 Water temperature mode icon

There are 3 phases

- When $140^{\circ}\text{F} \geq \text{TS} \geq 120^{\circ}\text{F}$, all 3 phases will be illuminated.
- When $120^{\circ}\text{F} \geq \text{TS} \geq 110^{\circ}\text{F}$, lower 2 phases will be illuminated.
- When $110^{\circ}\text{F} \geq \text{TS} \geq 100^{\circ}\text{F}$, lowest phase will be illuminated.

Note: TS is preset water temperature.

11 Parameter display

This icon illuminates when power supply is connected and normally shows water temperature. When there is an error or protection, it will show error code or protection code. When error or protection stops, it will show water temperature again. When using the "query" function will show unit parameters.

12 Vacation time and diagnostic display

This icon is for setting the number of days for vacation mode and is also used as a indicator when in diagnostic function.

4.2 Safety warnings



Warning: Hydrogen gas can be produced in a hot water system served by this water heater that has not been used for a long period of time (generally two weeks or more).

HYDROGEN GAS IS EXTREMELY FLAMMABLE!

To dissipate such gas and to reduce risk of injury, it is recommended that the hot water faucet be opened for several minutes at the kitchen sink before using any electrical appliance connected to the hot water system. If hydrogen is present, there will be an unusual sound such as air escaping through the pipe as the water begins to flow. Do not smoke or use an open flame near the faucet at the time it is open.



Caution: Turn off power to water heater if it has been subjected to overheating, fire, flood or physical damage.



Caution: Do not turn on water heater unless it is filled with water or internal damage may occur.



Caution: To avoid thermal expansion and the potential that the water heater may burst, do not turn on water heater if cold water supply shut-off valve is closed.



Danger: To avoid the potential for ignition and fire, do not store or use gasoline or other flammable vapors and liquids, such as adhesives or paint thinner, in the vicinity of this or any other appliance. If such flammables must be used, open doors and windows for ventilation.



Warning: If there's any difficulty in understanding or following the Operating Instructions or the Care and Cleaning section, it is recommended to have a qualified person or serviceman performing the work.



Flammable vapours may be drawn by air currents from surrounding areas to the water heater.

4.3 Water temperature setting

The temperature of the water in the water heater can be regulated by adjusting the temperature setting up or down using arrow keys on the control panel.

Safety and energy conservation are factors to be considered when selecting the water temperature setting of the water heater. The lower the temperature setting, the greater the savings in energy and operating costs.

To comply with safety regulations, the water temperature is factory set at 120°F where local codes require. This is the recommended starting point.

Water temperatures above 125°F can cause severe burns or death from scalding. Be sure to read and follow the warnings outlined in this manual and on the label on the water heater. This label is located on the water heater near the upper element access panel.

Mixing valves for reducing point-of-use water temperature by mixing hot and cold water in branch water lines are available. Contact a licensed plumber or the local plumbing authority for further information.

The chart below may be used as a guide in determining the proper water temperature for your home.



Danger: There is a hot water scald potential if the water temperature is set too high. Households with small children, disabled, or elderly persons may require a 120°F or lower thermostat setting to prevent contact with HOT water that may cause scalding and serious injury.

Time/Temperature Relationship in Scalds

Temperature	Time to produce a serious burn
120°F	More than 5 minutes
125°F	1-1/2 to 2 minutes
130°F	About 30 seconds
135°F	About 10 seconds
140°F	Less than 5 seconds
145°F	Less than 3 seconds
150°F	About 1-1/2 seconds
155°F	About 1 second

Table 4

4.3.1 To adjust the temperature

- Press the UP or DOWN arrow on the control panel key pad.
Then the temperature can be increased or decreased by pressing the UP or DOWN arrows.
Finally press the ENTER button to confirm.

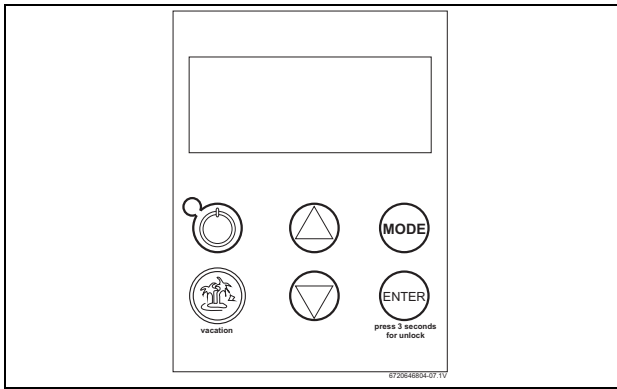


Fig. 16



Danger: If the water temperature is set too high, you may suffer a scalding injury from hot water; after you have set the temperature setting, check the temperature of the water to ensure it is not too hot. 120°F is the recommended water temperature setting.

4.4 Operating modes

This water heater defaults to the Auto operating mode. The Auto mode is the recommended setting for this water heater, but can be changed if desired.

Economic Mode

Economic is the the most energy-efficient mode for this water heater. It takes heat from the surrounding air to heat the water. The time it takes to heat the water is longer in this mode, so it may NOT be sufficient if you have a high-demand situation such as a large household.

Electric Mode

This mode uses only the upper and lower heating resistance elements to heat the water. The time it takes to heat the water is less in this mode, but it is the LEAST energy-efficient mode.

Auto Mode (recommended mode)

Auto mode combines the energy efficiency of Economic with the recovery speed and power of the Electric mode, with normal water usage.

4.5 Feature buttons on the user interface

Vacation mode

This feature is used when you will be away from the home for an extended period of time and hot water is not needed. In this mode, the unit will drop the water temperature down to 50°F and will use the most efficient heating mode to conserve energy while the heater is sitting idle. The unit will automatically resume

heating one day before your return, so that hot water will be available.

For example if you will be gone 14 days, press the VACATION OR AWAY button, press the UP arrow button until the display reads 14 days (the default is 14 days) and press ENTER. The unit will drop the water temperature down to 50°F for 13 days. At the end of the 13th day, it will automatically return to the previous operating mode and heat the water to the original temperature setting.

Control lock

The control pad can be locked out to prevent accidental key presses.

Simply press and hold the ENTER button for three seconds. The display will show the lock icon when this feature has been activated. No other key presses will be allowed when the controls are locked.

To deactivate the lock, press and hold the ENTER pad for three seconds. The screen will go to the default display.

4.6 Using the combination buttons

By pressing select buttons on the control panel in combination, a variety of options and parameters can be changed.

4.6.1 °F and °C conversion

The water temperature display will default to °F.

To show the temperatures in °C:

- ▶ Press the ENTER and MODE buttons simultaneously for 1 second.

NOTE: To change back to °F, repeat the step above.

4.6.2 Inquire component's parameter

To inquire component's parameters:

- ▶ Press the ENTER and UP buttons simultaneously for 1 second.

NOTE: To exit the inquire function, repeat the step above.

4.6.3 Clear malfunction

To clear a malfunction:

- ▶ Press the ENTER and DOWN buttons simultaneously for 1 second.

4.6.4 Clear an alarm

To clear an alarm:

- ▶ Press the ENTER and DOWN buttons simultaneously for 1 second.

4.7 Reset the temperature limiting control

- ▶ Turn off power to the water heater.
- ▶ Pull off front cover below control pad (secured with magnet). Remove upper jacket access panel (Fig. 8) and insulation to access both temperature limiter resets and insulation.
The thermostat protective cover should not be removed.
- ▶ Press both red reset buttons to reset.
- ▶ Replace the insulation and jacket access panel(s) before turning on the power to the water heater.



NOTE: if the power for the water heater is turned off and then back on, the compressor will not start for 3 minutes to avoid internal damage.

5 Maintenance and repair



Warning: Internal components of the heater can become extremely hot during operation. Use caution when servicing and removing the front and rear covers.



Warning: Before manually operating the relief valve, make certain no one will be exposed to the danger of coming in contact with the hot water released by the valve. The water may be hot enough to create a scald hazard. The water should be released into a suitable drain to prevent injury or property damage.



If the temperature and pressure-relief valve on the hot water heater discharges periodically, this may be due to thermal expansion in a closed water system. Contact the water supplier or your plumbing contractor on how to correct this. Do not plug the relief valve outlet.



NOTE: If the power for the water heater is turned off and then back on, the compressor will not start for 3 minutes to avoid internal damage..

Properly maintained, your water heater will provide years of dependable trouble-free, economic service. It is suggested that a routine preventive maintenance program be established and followed by the user

5.1 Periodic Inspection

It is further recommended that a periodic inspection of the operating controls, heating elements and wiring should be made by service personnel qualified in electric appliance repair.

Most electrical appliances, even when new, make some sound when in operation. If the hissing or singing sound level increases excessively, the electric heating element may require cleaning. Contact a qualified installer or plumber inspection.

5.2 Temperature and pressure relief valve



Danger: Before manually operating the relief valve, make certain no one will be exposed to the hot water released by the valve. The water drained from the tank may be hot enough to present a scald hazard and should be directed to a suitable drain to prevent injury or damage.



Warning: If a relief valve discharges water periodically, this may be due to thermal expansion in a closed water supply system. Contact your installer or service provider for assistance. Do not plug the relief valve.

At least once a year.

- lift and release the lever handle on the temperature and pressure-relief valve, located on the back-right side of the water heater to make certain the valve operates freely.

Allow several gallons to flush through the discharge line to an open drain.

5.3 Flushing tank

A water heater's tank can act as a settling basin for solids suspended in the water. It is therefore not uncommon for hard water deposits to accumulate in the bottom of the tank.

To clean the tank of these deposits:

- Open the drain valve located near the bottom of the unit and drain a few quarts of water from the water heater once a year.

5.4 Draining the Water Heater



Caution: Shut off power to the water heater before draining water.



Danger: The water drained from the tank may be hot enough to present a scald hazard and should be directed to a suitable drain to prevent injury or damage.

- Attach a garden hose to the drain valve located at the bottom of the unit and direct that hose to a drain.

The decorative front cover must be removed to access the valve.

In order to drain the water heater completely:

- ▶ Turn off the cold water supply.
- ▶ Open a hot water faucet or lift the handle on the relief valve to admit air to the tank.

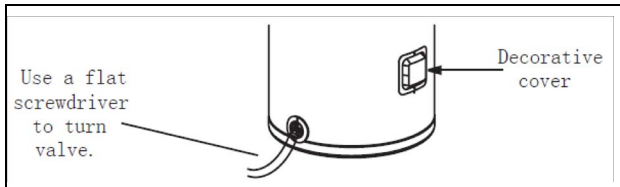


Fig. 17

- ▶ Open the drain valve.

5.5 Vacation and Extended Shutdown

If the water heater is to remain idle for an extended period of time, the power and water to the appliance should be turned off to conserve energy and prevent the buildup of dangerous hydrogen gas.

The water heater and piping should be drained if they might be subjected to freezing temperatures. After a long shutdown period, the water heater's operation and controls should be checked by qualified service personnel. Make certain the water heater is completely filled again before placing it in operation.



Note: refer to the Hydrogen Gas Caution in the Operating Instructions.

5.6 Cleaning the Filter

In the Auto and Economic modes, the heater moves air through the system and out the back of the unit. The filter is in place to protect the evaporator from dirt and dust.

A clean air filter is important to get the highest efficiency. Occasionally this filter will need to be cleaned (minimum is once a year).



If the filter gets too dirty, the unit will automatically switch to Standard Electric mode and energy savings will be lost.

- ▶ Leave the power on.
- ▶ Remove the filter from the top of the unit.

It is located in the top of the unit behind the hot and cold inlet pipes.

- ▶ Grasp the plastic handle
- ▶ Slide the filter straight up until it clears the shroud. Once it has been removed, the filter can be wiped clean with a damp rag or rinsed with warm water.

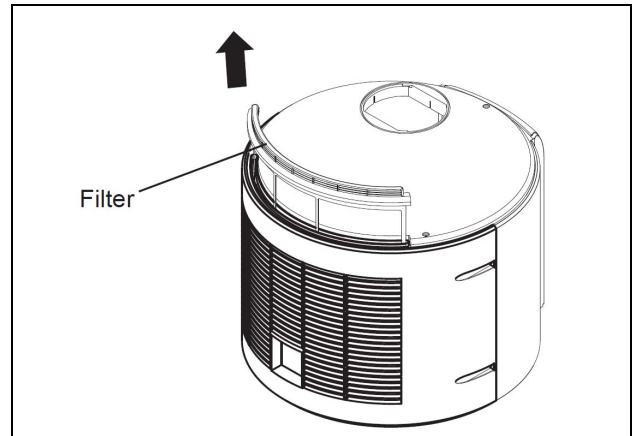


Fig. 18

Once the filter has been cleaned, it can be replaced by aligning it into the slot in the top of the unit and sliding it down into place. When the handle is flush with the top of the shroud, it is seated.

When the clean filter has been reinstalled:

- ▶ Press ENTER and DOWN keys simultaneously for 2 seconds.

IMPORTANT: A dirty filter will make the system work harder and result in a reduction of efficiency and possible damage to the system. In order to get the best energy efficiency available, make sure your filter is clean.

5.7 Clearing the Condensation Drain Tubes

There are two drain hoses that are attached to the back of the heater. If both of these get clogged, water will spill down the outside of the unit.

The primary drain is intended to carry all condensate away. If it is clogged or if the hose is kinked, the condensate will exit the secondary drain tube and onto the floor. This is intended as a notification to the user that the primary drain is clogged.

- ▶ Remove the drain hose.
- ▶ Clear any debris and reattach.

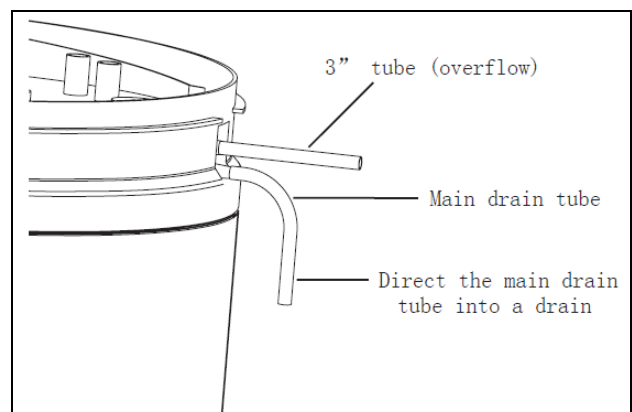


Fig. 19

- ▶ Periodically inspect the drain lines and clear any debris that may have collected in the lines.
- ▶ See Installation Instructions for more information.

5.8 Anode Rod servicing

A water heater anode rod is the most important safety guard any storage tank has against corrosion and premature failure.

Inspecting the anode rod is therefore very important.

Sacrificial rods are designed to deteriorate overtime.

Most water heating industry professionals recommend inspecting the anode about every 2 years.

Homes with salty or softened water supplies should consider more frequent inspection. When in doubt consult a local water heating professional.

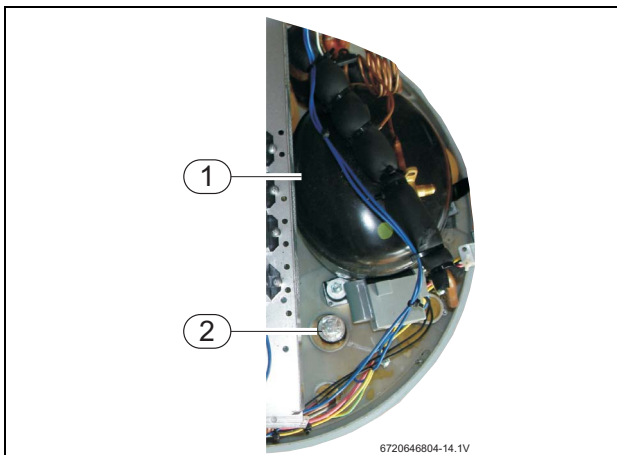


Fig. 20 Water heater top view

- 1 Compressor
- 2 Anode Rod

6 Troubleshooting/Problem Solving



NOTE: if the power for the water heater is turned off and then back on, the compressor will not start for 3 minutes to avoid internal damage.

Problem	Cause	Solutions
Water heater is noisy.	Fans are used to move air through the system. The fan noise volume will vary as the water is heated.	Some amount of fan noise is normal (similar to the blower on a central heating and cooling system). If you hear an abnormal noise like a knocking or the noise level seems unusually loud, please contact service.
		If noise level has been increasing over the last weeks or months, the filter may be getting dirty thus making the fan work harder. Check to see if filter needs to be cleaned. (See page 24 for instructions).
Water heater is making the room too cold.	Room is not vented properly or is too small.	If the room is smaller than 10' x 10' x 7', then a louvered door or other means to allow air exchange with surrounding rooms will be necessary.
Water dripping down the outside of the heater.	Condensate drain hoses are not connected.	Two drain hoses are included with your water heater. Connect the longer 6' hose to the lower condensate drain port. Connect the short 3" hose to the upper condensate drain port.
	Condensate drain hoses are kinked or clogged.	Remove each drain hose and clear any debris from the line. You can use a small wire like a hanger or a small screwdriver to clear out any debris in the drain port the unit.
	Hot/Cold water connections are not tightened.	Tighten the inlet and outlet pipe connections.

Table 5

Problem	Cause	Solutions
Not enough or no hot water.	Water usage may have exceeded the capacity of the water heater.	Wait for the water heater to recover after an abnormal demand.
	A fuse is blown or a circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Electric supply may be off.	Make sure electric supply to water heater and disconnect switch, if used, are in the ON position.
	Water temperature may be set too low.	See the Water temperature setting section.
	Leaking or open hot water faucets.	Make sure all faucets are closed.
	Electric service may be interrupted.	Contact the local electric utility supplier.
	Improper wiring.	See the Installation Instructions section.
	Manual reset limit (TCO).	See the Water temperature setting section.
	Cold water inlet temperature may be colder during winter months.	This is normal. The colder inlet water takes longer to heat.
Water is too hot.	Water temperature is set too high.	See the Water temperature setting section.
	Electronic control has failed.	Call for service.
Rumbling noise.	Water conditions in your home caused a buildup of scale or mineral deposits on the heating elements.	Remove and clean the heating elements.
Relief valve producing popping noise or draining.	Pressure buildup caused by thermal expansion to a closed system.	This is an unacceptable condition and must be corrected. Contact the water supplier or plumbing contractor on how to correct this. Do not plug the relief valve outlet.
The filter light is on.	The filter requires cleaning. A clean filter is necessary for effective operation.	Follow the instructions on how to remove and clean the filter on page 24.
Unit is not making noise.	If unit is using the electric elements, it will not make noise.	Check mode of unit.

Table 5

Error code	Meaning	Solutions
E0	T2 sensor malfunction	1. Check wires for damage.
		2. Check T2 sensor. Check wire connections from sensor to control board.
		3. Check T2 whether interfere with strong magnetic field.
		4. Check actual temp. whether in 0°C - 60°C (tolerance +5°C).
E1	T3a sensor malfunction	1. Check wires for damage. Measure resistance from control board connection. Refer to thermister table 8. This is a 55 kOhm thermister.
		2. Check wire connections from sensor to control board.
		3. Check T3a sensor damage or not (resistance).
		4. Check T3a whether interfere with strong magnetic field.
		5. Check actual temp. whether in -5°C - 30°C (tolerance +5°C).
		6. Check TXV for damage.
E4	T3b sensor malfunction	1. Check wires for damage. Measure resistance from control board connection. Refer to thermister table 8.
		2. Check wire connections from sensor to control board.
		3. Check T3b sensor for damage.
		4. Check T3b whether interfere with strong magnetic field
		5. Check actual temp. whether in 0°C - 30°C
E5	T4 sensor malfunction	1. Check wires for damage. Measure resistance from control board connection. Refer to thermister table 8.
		2. Check wire connections from sensor to control board.
		3. Check T4 sensor for damage.
		4. Check T4 whether interfere with strong magnetic field.
		5. Check actual temp. whether in 30°C - 110°C (tolerance ±5°C)
		6. Check refrigerant tubing for damage.
		7. Check for refrigerant leakage.

Table 6

Error code	Meaning	Solutions
E6	T5 sensor malfunction	1. Check wires for damage. Measure resistance from control board connection. Refer to thermostat table 7
		2. Check wire connections from sensor to control board.
		3. Check T5 sensor for damage.
		4. Check T5 whether interfere with strong magnetic field.
E7	Heat pump malfunction	1. Heat pump has cycled off. If Temperature setting is $>5^{\circ}\text{F}$ above tank temperature, the heat pump should restart within 15 minutes.
		2. Spot inspection, check the last three error codes to evaluate problem. Call service provider. "LOCK + UP" Enter spot inspection.
E8	Water temperature is too high ($T2 \geq 165^{\circ}\text{F}$)	1. Power off can resume.
		2. Check actual water temperature. Replace T2 sensor if defective.
P0	Out of Run condition C	Run condition C: $T3a(30\text{min}) > 20^{\circ}\text{F}$ Cont. check after 30 min.
P1	Out of Run condition D	Run condition D: $T3b-T3a > 3^{\circ}\text{F}$ Cont. check after 30 min.
P2	Out of Run condition E	Run condition E: $T4 < 240^{\circ}\text{F}$ Cont. check
P4	Compressor current is too high	1. Check that supply voltage $> 260\text{ VAC}$.
		2. Check compressor for damage.
P6	Out of Run condition A	Run condition A: $T4(5\text{ min}) > T4(0\text{ min}) + 15^{\circ}\text{F}$ One time check
P7	Out of Run condition B	Run condition B: $T4 > 100^{\circ}\text{F}$ Cont. check after 30 min.

Table 6

Error code	Meaning	Solutions
P8	Upper Element has no current	1. Check power voltage whether in normal working range.
		2. Check wire connections.
		3. Check temperature limiters (TCOs).
		4. Check upper heating element for damage.
		5. Check the wire whether through current sensor in PCB.
		6. Check resistance through element (15.8 ± 1 amp).
PA	Lower Element has no current	Check wire connections from sensor to control board.
		Check power voltage whether in normal working range.
		Check power code connect correct or not.
		Check temperature limiters (TCOs).
		Check lower element for damage.
		Check resistance through element (15.8 ± 1 amp)

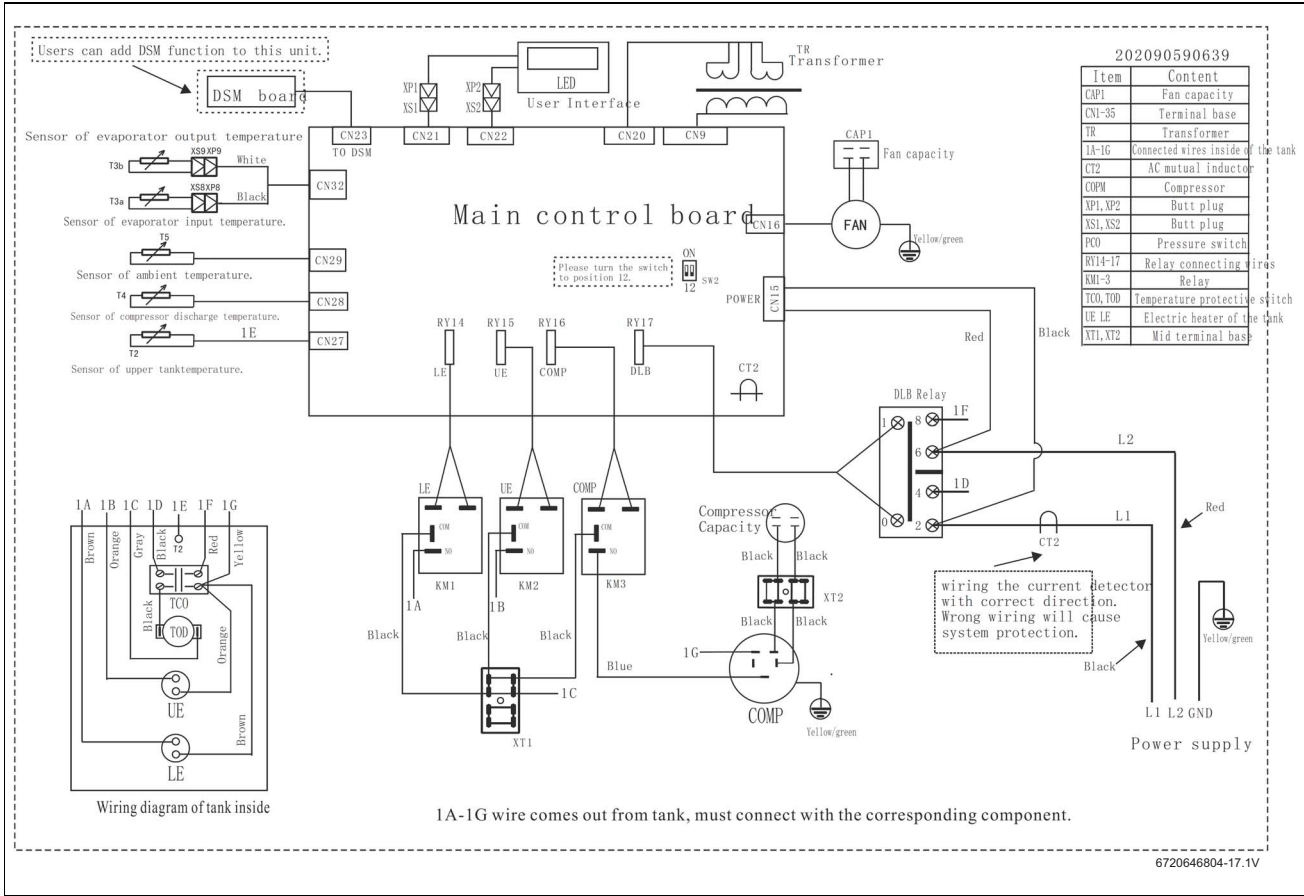
Table 6

°C	KOhm		°C	KOhm
-40	336.00		85	1.070
-35	242.70		90	0.915
-30	177.00		95	0.787
-25	130.40		100	0.680
-20	97.06		105	0.592
-15	72.94		110	0.517
-10	55.32		115	0.450
-5	42.32		120	0.390
0	32.65		125	0.340
5	25.40		130	0.300
10	19.90		135	0.265
15	15.71		140	0.235
20	12.49		145	0.209
25	10.00		150	0.185
30	8.06		155	0.162
35	6.53		160	0.145
40	5.33		165	0.130
45	4.37		170	0.118
50	3.60		175	0.107
55	2.99		180	0.097
60	2.49		185	0.087
65	2.08		190	0.079
70	1.75		195	0.072
75	1.48		200	0.065
80	1.26			

Table 7 Resistance table for T3a, T3b, T5 sensor

°C	KOhm		°C	KOhm		°C	KOhm		°C	KOhm
-20	542.7		20	68.66		60	13.59		100	3.702
-19	511.9		21	65.62		61	13.11		101	3.595
-18	483.0		22	62.73		62	12.65		102	3.492
-17	455.9		23	59.98		63	12.21		103	3.392
-16	430.5		24	57.37		64	11.79		104	3.296
-15	405.7		25	54.89		65	11.38		105	3.203
-14	384.3		26	52.53		66	10.99		106	3.113
-13	363.3		27	50.28		67	10.61		107	3.025
-12	343.6		28	48.14		68	10.25		108	2.941
-11	325.1		29	46.11		69	9.902		109	2.86
-10	307.7		30	44.17		70	9.589		110	2.781
-9	291.3		31	42.33		71	9.248		111	2.704
-8	275.9		32	40.57		72	8.94		112	2.63
-7	261.4		33	38.89		73	8.643		113	2.559
-6	247.8		34	37.30		74	8.358		114	2.489
-5	234.9		35	35.78		75	8.094		115	2.422
-4	222.8		36	34.32		76	7.82		116	2.357
-3	211.4		37	32.94		77	7.566		117	2.294
-2	200.7		38	31.62		78	7.321		118	2.233
-1	190.5		39	30.36		79	7.086		119	2.174
0	180.9		40	29.15		80	6.859		120	2.117
1	171.9		41	28.00		81	6.641		121	2.061
2	163.3		42	26.90		82	6.43		122	2.007
3	155.2		43	25.85		83	6.228		123	1.955
4	147.6		44	24.85		84	6.033		124	1.905
5	140.4		45	23.99		85	5.844		125	1.855
6	133.5		46	22.99		86	5.663		126	1.808
7	127.1		47	22.10		87	5.488		127	1.762
8	121.0		48	21.25		88	5.32		128	1.717
9	115.2		49	20.45		89	5.157		129	1.674
10	109.8		50	19.69		90	5.0		130	1.632
11	104.6		51	18.96		91	4.849			
12	99.69		52	18.26		92	4.703			
13	95.05		53	17.58		93	4.552			
14	90.66		54	16.94		94	4.426			
15	86.49		55	16.32		95	4.294		B (25/50) = 3950K	
16	82.54		56	15.73		96	4.167			
17	78.79		57	15.16		97	4.045		R (90°C) = 5KΩ ± 3%	
18	75.24		58	14.62		98	3.927			
19	71.86		59	14.09		99	3.812			

Table 8 Resistance table of T4 sensor



8 Interior components and parts list

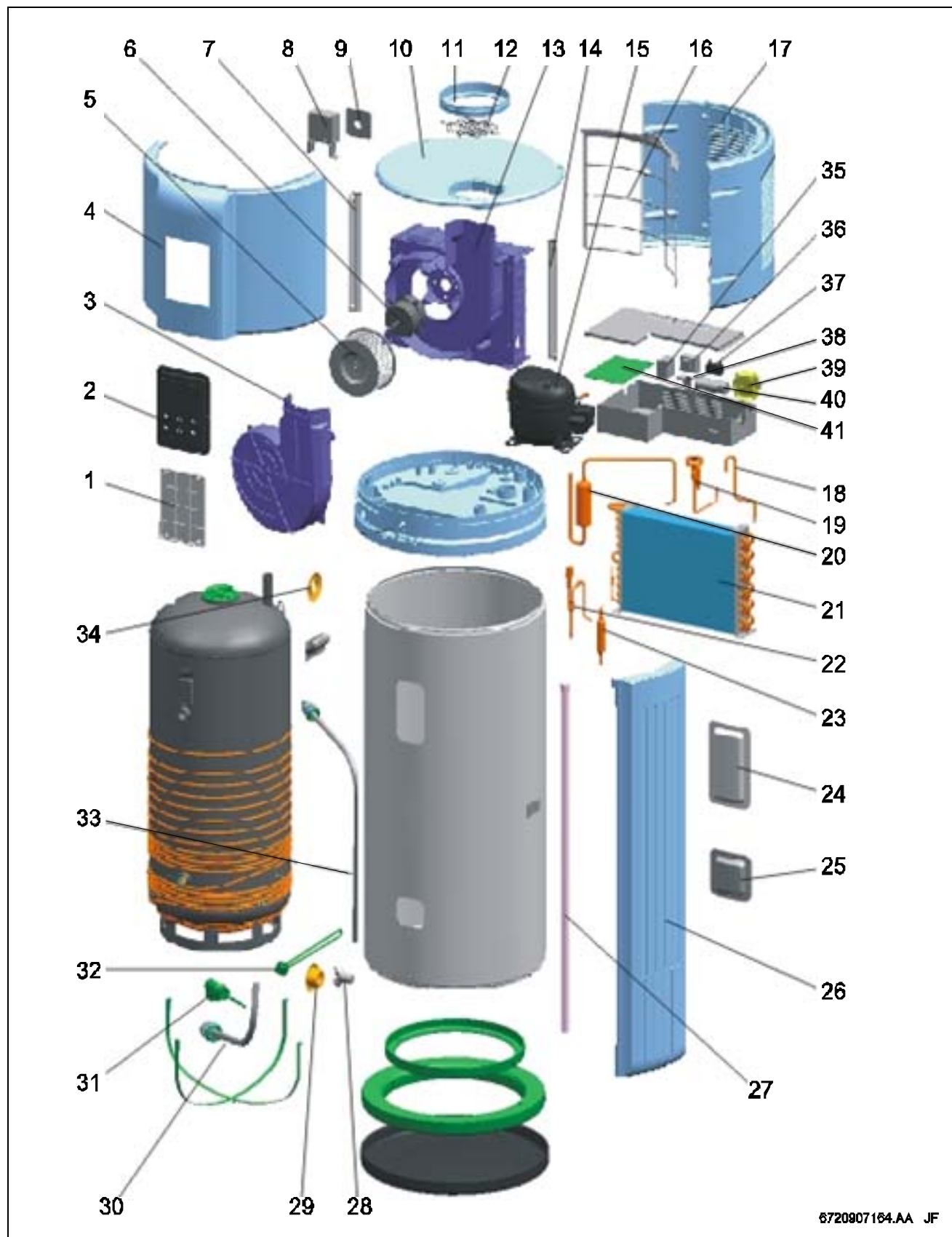


Fig. 22

Nr.	Code	Comp. description
1	8 738 721 051 0	Screen cover
2	8 738 721 052 0	Membrane
3	8 738 721 053 0	Back volute cover
4	8 738 721 054 0	Front shroud
5	8 738 721 055 0	Centrifugal fan assembly
6	8 738 721 060 0	Fan motor
7	8 738 721 062 0	Left rail
8	8 738 721 063 0	Wire connect box assembly
9	8 738 721 064 0	Wire connect box cover
10	8 738 721 065 0	Top cover
11	8 738 721 066 0	Air duct port
12	8 738 721 068 0	Steet net
13	8 738 721 069 0	Front volute cover
14	8 738 721 070 0	Right rail
15	8 738 721 072 0	Compressor
16	8 738 721 073 0	Air filter
17	8 738 721 074 0	Back shroud
18	8 738 721 244 0	Filter pipe II
19	8 738 721 245 0	TXV assembly
20	8 738 721 246 0	Accumulator assembly
21	8 738 721 247 0	Evaporator assembly
22	8 738 721 248 0	Gas discharging pipe assembly
23	8 738 721 249 0	Dryer
24	8 738 721 077 0	Upper electric heater cover
25	8 738 721 078 0	Lower electric heater cover
26	8 738 721 079 0	Front cover
27	8 738 721 044 0	Anode rod
28	8 738 721 045 0	Drain valve
29	8 738 721 046 0	Cover of T&P valve port
30	8 738 721 233 0	Water outlet pipe
31	8 738 721 047 0	T&P valve
32	8 738 721 048 0	Electric heater
33	8 738 721 235 0	Water inlet pipe
34	8 738 721 050 0	Cover of water inlet port
35	8 738 721 236 0	Relay
36	8 738 721 237 0	Two way relay
37	8 738 721 238 0	Capacitor
38	8 738 721 239 0	Capacitor holder
39	8 738 721 240 0	Transformer
40	8 738 721 241 0	Compressor capacitor
41	8 738 721 242 0	Mainboard assembly

Table 9

9 Protecting the environment

Packing

The packing box may be fully recycled as confirmed by the recycling symbol .

Components

Many parts in the heater can be fully recycled in the end of the product life. Contact your city authorities for information about the disposal of recyclable products.

Saving water resources:

- ▶ Make sure you close all the taps after any use. Avoid leaving the taps dripping. Repair any leaking tap.
- ▶ Define the temperature you want, in the appliance. This way you have the precise water flow needed (mixing cold water to regulate temperature will increase the water flow with consequent waste of water).

Refrigerant

At the end of the service life of this appliance and prior to its environmental disposal, a person qualified to work with refrigerant circuits must recover the refrigerant from within the sealed system.



Warning: The refrigerant must not be vented to the atmosphere.

10 Limited Warranty

MODELS COVERED

This limited warranty is provided by Bosch Thermotechnology Corp. (BTC) and covers Bosch Compress 3000 Water Heater (hereinafter referred to as "Water Heater"). This warranty is provided to the original purchaser of the Water Heater as long as the Water Heater remains installed at its original place of installation.

WARRANTY COVERAGE

First Year - Limited Warranty

BTC warrants that the Water Heater shall remain free from defects in workmanship and materials for ten years from the date of original installation provided they are installed and properly maintained by a qualified heating contractor and the other conditions of this warranty are met. If BTC determines that the Water Heater or any part of Water Heater has a defect in workmanship or materials, BTC, at its option, will repair or replace, including labor charges at BTC approved rates, the defective part for the first year from the date of original installation, provided it is installed and properly maintained by a qualified heating contractor and the other conditions of this warranty are met.

Second through Tenth Year - Limited Warranty

BTC warrants that the Water Heater shall remain free from defects in workmanship and materials for ten years from the date of original installation provided they are installed and properly maintained by a qualified heating contractor and the other conditions of this warranty are met. If BTC determines that the Water Heater or any part of Water Heater has a defect in workmanship or materials, BTC, at its option, will repair or replace the defective part. Labor charges are not included.

OTHER WATER HEATER COMPONENTS

The Water Heater may be installed with other components not manufactured by BTC ("Other Components"). Other Components are warranted by the manufacturer.

ITEMS NOT COVERED

This limited warranty does not cover the following circumstances:

1. Water Heater installed in a building other than a single family residential dwelling, unless individual Water Heaters are installed for each dwelling unit.
2. Components or parts not provided by BTC.
3. Serviceable items and normal maintenance as required per the Installation Manual.
4. The workmanship of any installer. BTC disclaims and does not assume any liability of any nature for unsatisfactory performance caused by improper installation, repair or maintenance.
5. Any labor or material costs for removal, reinstallation, repair and replacement of the defective component or part unless otherwise provided above.
6. Transportation to BTC, if necessary.
7. Damage caused by abuse, accident, neglect, excessive water temperatures, freezing, flooding or acts of God.
8. Damage caused by operation with either the temperature sensor rod or overheat sensor removed or T&P valve obstruction.
9. Damage caused by scale deposits and/or highly mineralized/unsoftened water supply. See Installation Manual for details.
10. Except as set forth above related to Other Components, components that are part of the water heating system into which the Water Heater is incorporated that are not Bosch products are not covered by this warranty and are limited to the warranty of the manufacturer of such components. In order to file a claim for warranty you should contact the manufacturer.
11. Shipping charges, delivery expenses or administrative fees incurred by the purchaser in repairing or replacing the Water Heater.

CONDITIONS OF WARRANTY

The warranty herein is void under the following circumstances:

1. Failure or malfunction resulting from improper or negligent operation, accident, abuse, freezing, misuse, unauthorized alteration or improper installation, repair or maintenance. See the Owner's Manual for installation and maintenance information.
2. Failure or malfunction resulting from operation of Water Heater in a corrosive atmosphere or at water temperatures exceeding the maximum rating.
3. Failure or malfunction resulting from operation of Water Heater not supplied with potable water or is operated with water that may cause deposits or corrosion.
4. Work performed without prior authorization or approval and without authorization/requisition number and without proper documentation verifying compliance with above terms.

LIMITED WARRANTY

OTHER THAN THE OBLIGATIONS OF BTC EXPRESSLY SET FORTH HERIN, BTC DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. BTC'S SOLE OBLIGATION WITH RESPECT TO THE WATER HEATER AND

PURCHASER'S EXCLUSIVE REMEDIES ARE SET FORTH IN THE FOREGOING LIMITED WARRANTY. BTC SHALL NOT BE LIABLE FOR ANY INDIRECT, PUNITIVE, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR SIMILAR DAMAGES INCLUDING, WITHOUT LIMITATION, INJURY OR DAMAGE TO PERSONS OR PROPERTY OR DAMAGES FOR LOSS OF USE, LOST PROFITS, INCONVENIENCE OR LOSS OF TIME.

NOTE THAT ANY REPAIRED OR REPLACED PRODUCT WILL BE WARRANTED FOR ONLY THE UNEXPIRED TERM OF THE ORIGINAL WARRANTY.

Some states do not allow the exclusion of limitation of damages, or limitations on how long an implied warranty lasts, so the above limitations and exclusions may not apply to you.

WARRANTY CLAIMS PROCESS

If you have a warranty claim you should notify the heating contractor who installed your Water Heater and ask that the contractor notify the distributor from whom the contractor purchased the Water Heater. If this action is not possible or you don't receive a response, contact Bosch Thermotechnology Corp., 50 Wentworth Avenue, Londonderry, NH 03053. To process your claim, you will need a copy of your original invoice or other proof of purchase and documentation showing the original installation date and location. The alleged defective components or parts must be returned to BTC in accordance with BTC procedure then in force for handling goods returned for the purpose of inspection to determine cause of failure (contact BTC if you have questions regarding the return process). If BTC determines that the returned components and/or parts are defective and that this warranty applies, BTC will furnish the repaired or replacement components and/or parts to an authorized BTC distributor who, in turn, will forward the components and/or parts to the heating contractor who installed your Water Heater.

Effective for sales on or after 1/1/2011.

Replacement Parts available from:

**BOSCH THERMOTECHNOLOGY
CORP.**

50 Wentworth Avenue
Londonderry, NH 03053 USA
Tel. 866-330-2730
www.boschpro.com